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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,185	08/26/2005	David William Sheel	264240US2PCT	3653
22850 7590 07/05/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER BERRY, RENEE R	
			ART UNIT 1762	PAPER NUMBER
			NOTIFICATION DATE 07/05/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/522,185	Applicant(s) SHEEL ET AL.	
	Examiner Renee R. Berry	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/14/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-48 is/are pending in the application.
- 4a) Of the above claim(s) 46-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 46-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **with** traverse in the reply filed on November 6, 2006.

Applicant's election with traverse of Group I in the reply filed on November 6, 2006 is acknowledged.

Applicant's election with traverse of Group I in the reply filed on November 6 is acknowledged. The traversal is on the ground(s) that the search would not be an additional burden. This is not found persuasive because the inventions are classified in two different areas and are patentably distinct and therefore it would be an additional burden on the Examiner to consider the two different inventions under two different standards.

The requirement is still deemed proper and is therefore made FINAL.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification lacks antecedent basis for "water or liquid coolant based cooling" in claims 30 and 31. Claim 38 teaches "electrodes made of brass" and there is no teaching in the specification for brass electrodes. The specification also lacks antecedent basis for the subject matter taught in claims 33-41 and 43-45.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 25-45 are rejected under 35 USC § 112 second paragraph.

Claims 33, 41, and 42 recites the limitation "can be" in line 1 of the claims.

There is insufficient antecedent basis for this limitation in the claim. The problem is that by saying "can be" it is not clear if the steps that follow are required or not or only the capability of doing them.

Claim 25 teaches a temperature of 250 °C. However, it is not clear if 250 °C is required for the process or does that temperature just qualify "to improve film properties." Also in claim 25, "the introduced gas flow" is not clear, because there is no mention where the gas is introduced and there is no previous introduction step.

Claim 25, line 1, "titania-containing" confusing as to what follows Should it be titania-containing "coating?"

Claim 25, line 4, "improve film properties and film growth rates" confusing as to what the improvement is in comparison to.

Claims 25, lines 6-7, the claim has no requirement of deposition on the substrate as referred to in preamble and no connection to how plasma process used as part of coating.

The other dependent claims do not cure the defects of the claims from which they depend.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25-29, 32-36, 39-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,5156,882 to Rzaad et al. in view of US Pub No. 2005/0098115 to Barnes et al.

In regard to claim 25, Rzaad teaches a method for depositing titania, or titania-containing as thin films on a substrate, the method comprising: using glow discharge plasma as a major source of reaction to improve film properties and film growth rates, when the substrate is heated at a temperature below 250.degree. C., introducing a reactive titania CVD precursor which has been pre-vaporized into the introduced gas flow into a gas flowing through a coating region at column 5, lines 20-46, column 6, lines 14-24 and column 7, lines 5-10.

In regard to claim 26, Rzaad teaches a method according to claim 25, wherein a post treatment of the coating with glow discharge plasma modifies the film properties and

Art Unit: 1762

structure at column 6, lines 37-43 and at column 9, lines 56-65 (glow discharge/microwave occurs at 3-30GHz). Post-treatment would be example 1, column 13, lines 1-40 where treatment with the layer applied over TiO₂ layer.

In regard to claim 27, Rzađ teaches a method according to claim 26, wherein the glow discharge post treatment modifies the film stoichiometry allowing control of film properties at column 6, lines 37-43 and column 9, lines 56-65 (glow discharge/microwave occurs at 3-30GHz).

In regard to claim 28, Rzađ teaches a method, wherein a laminar flow is introduced into and through the coating region at column 9, lines 16-25.

In regard to claim 29 Rzađ teaches a method according to claim 25, wherein an extraction system is employed to control gas flow through the coating region which supports controlled flow at column 6, lines 24-25, column 8, lines 29-54, column 10, lines 29-35 and column 11, lines 4-12.

In regard to claim 32, Rzađ teaches a method according to claim 29, wherein the reactive titania CVD precursor which is introduced in the coating region is an alkoxide of titanium or titanium tetrachloride at column 8, lines 44-50.

In regard to claim 33, Rzađ teaches a method according to claim 29, wherein films can

Art Unit: 1762

be deposited with high uniformity by using laminar flow column 9, lines 16-25. As Rza discloses maximizing uniformity using laminar flow, it would have been obvious to obtain values in the claimed range through routine experimentation or optimization.

In regard to claim 34, Rza teaches a method according to claim 25, used to build up a thicker layer or layers of different composition by arranging sequential coating regions along a direction of movement of the substrate at Example 1.

In regards to claim 36, Rza teaches a method according to claim 25, wherein the glow discharge plasma is generated, between electrodes, by a low frequency source in which the frequency is below 100 KHz and preferably below 30 KHz at column 9, lines 56-65.

In regard to claim 39, Rza suggestss a method according to claim 25, wherein power density of the plasma is below 5 Wcm^{-2} and preferably below 1 Wcm^{-2} and more preferably below 0.5 Wcm^{-2} at column 7, lines 53-55. Rza does not disclose a specific density, but states the invention improves the uniformity of the plasma density within the chamber. Therefore, it would have been obvious to obtain values in the claimed range through routine experimentation or optimization.

In regard to claim 40, Rza teaches a method according to claim 25, wherein peak growth rate is at least 10 nm per second, and up to several tens of nm per second, over 100 nm per second at column 11, lines 56-62. Therefore, it would have been obvious

Art Unit: 1762

to obtain values in the claimed range through routine experimentation or optimization.

In regard to claim 41, Rzađ teaches a method according to claim 25, wherein the film can be deposited on preformed and/or thermally toughened substrates at column 3, lines 67 and 68 to column 4, lines 1-3.

In regard to claim 42, Rzađ teaches a method according to claim 25, wherein the film can be deposited on temperature sensitive substrates including thermally preformed substrates and plastic substrate materials at column 2, lines 53-61.

In regard to claim 43, Rzađ teaches a method according to claim 25, wherein a level of water and oxygen are controlled to achieve target growth rates and to control unwanted side reactions, the oxygen level being below 5% and more preferably below 1%, the water vapor levels being controlled preferably below 1% and more preferably below 0.1 at column 7, lines 5-30. Rzađ does not teach a specific percentage, but states that liquid material such as silane or nitrous oxide help ensure proper metering of the plasma into the reactor chamber. Therefore, it would have been obvious to obtain values in the claimed range through routine experimentation or optimization.

In regard to claim 44, Rzađ teaches a method according to claim 43, suitable for coating moving substrates of a continuous film or sheet, or a series of substrates supplied semi-

continuously at column 7, lines 5-30.

However, Rzaad does not teach using an atmospheric pressure, as in claim 25 nor the use of different coating methods, as in claim 35.

In regard to claim 25, Barnes teaches using an atmospheric pressure at 0023, 0036 and 0069.

In regard to claim 35, Barnes teaches a method according to claim 25, used in combination with a different coating method at 0010.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Rzaad to include using an atmospheric pressure and different coating methods, since such a modification would result in suitable layers of titanium oxide as taught by Barnes at 0036 and one would reasonably expect to achieve the benefits taught at 0024 of Barnes resulting from use of atmospheric pressure.

Barnes teaches as in claim 43, that oxygen or water or silane components during the deposition process and those of skill in the art recognize various reactor configurations for accomplishing plasma deposition at column 8, lines 1-26. Therefore, to substitute nitrous oxide or silane with water or oxygen is an art recognized substitution.

Likewise, Barnes teaches various methods of coating, and the various methods are art recognized substitutes.

Art Unit: 1762

Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,156,882 to Rzaad in view of Barnes, further view of, for example, Horiike US 5185132.

In regards to claims 30 and 31, Horiike teaches a thermal control system at column 1-2 and column 3, lines 65 to column 4, line 2.

Therefore, it would have been obvious to one having ordinary skill in the art to have modified Rzaad to include a thermal control system, since such a modification would result in plasma stability under atmospheric pressure, as describe at column 1, lines 55-60 of Horiike.

Claim 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,156,882 to Rzaad et al. in view of Barnes as applied above and in further view of US Patent No. 6,197,120 to David.

Rzaad and David use aluminum electrodes.

In regard to claim 37, David teaches a method according to claim 36, wherein the metal electrodes are selected from a material that reduces heat generation at column 11, lines 1-3

In regard to claim 38, David teaches a method according to claim 36, wherein the electrodes are made of brass at column 11, lines 1-3.

Therefore, it would have been obvious to modify Rzaad to include brass electrodes, since such a modification is an art recognized substitution for aluminum electrodes, as taught at column 11, lines 1-3 of David.

Calim 45 is rejected under 35 U. S. C. 103(a) as being unpatentable over US Patent 5,156,882 to Rzaad et al. in view of US Patent 6,828,235 to Takano.

In regard to claim 45, Takano teaches a method according to claim 25, wherein one or more gas flushing zones is used to allow introduction, and removal, of the substrates while maintaining integrity of the coating region gas composition at column 6, lines 21-50.

Therefore, it would have been obvious to have modified Rzaad to include flushing zones, since such a modification would result in minimized contamination, as described in column 5, lines 25-27 of Takano.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renee R. Berry whose telephone number is (571) 272-1459. The examiner can normally be reached on 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RRB

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June 25, 2007


TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER